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The objectives were to find further needs and trends in research, examples of research to show direction for further investigation, and exchange of ideas. There were three generally accepted assumptions that brought about many ideas for research in the area of gifted children as well as children at all levels of ability. These were: 1) Intellectual talent should be considered multidimensional and needs to be in some respects redefined. 2) Intellectual talents are, to an unknown extent, capable of modification. 3) There exists a close relationship between motivation and personality variables and the development of intellectual abilities. Giftedness, factors related to cognitive development, social and educational environment, the culturally disadvantaged, research strategies and miscellaneous problems were the areas discussed.

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A Conference On Research On The Education Of Gifted Children

Cooperative Research Project No. F 006

JAMES J. GALLAGHER, EDITOR

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A Conference on Research on the Education of Gifted Children

James J. Gallagher

Institute for Research on Exceptional Children

University of Illinois

Urbana, Illinois

1963

The conference reported herein was supported by the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education and Welfare.

This final report was prepared by the chairman of the conference, from his own notes, the notes of the recorder of the conference, Professor Suchman, and with the help of additional notes from Dr. Aschner, and Dr. McGuire.

The ideas and concepts presented herein are the composite viewpoints of the conference participants. They should not be considered necessarily either the opinion or ideas of the chairman whose function in this report is to mirror the thoughts of the conferees rather than generate ideas of his own.

All of the participants received and were requested to comment on two drafts of this report before it took the present final form. Mrs. Gardiner Stillwell provided editorial assistance on the final copy.

J. J. G.

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Conference on Research on the Education of Gifted Children
at
Madison, Wisconsin

September 25-29, 1962

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Conference Background

The following is a report of a Conference on Research on the Education of Gifted Children, held at Madison, Wisconsin, on September 25-29, 1962, under the auspices of the Cooperative Research Branch of the U. S. Office of Education in cooperation with the University of Wisconsin and the University of Illinois. Twelve persons actively engaged in research on gifted children were invited to participate in a five-day working conference. The stated objectives of the conference were

1. To produce some consensus on further needs and trends in research on gifted children.

2. To present possible examples of research programs or sequences which could point out fruitful directions for further investigation.

3. To provide the individual contributor with an opportunity to broaden his own research horizons by cross-fertilization of his ideas with other specialists in his area of interest.

Little time was spent in the conference justifying the special attention being paid to this problem area. It was pointed out that the achievements of intellectually superior individuals cannot be equalled by adding together the achievements of any number of less talented people. The definition of a genius as "a person who does easily what no one else can do at all" is appropriate here. One cannot evaluate Michelangelo by saying that he is equal to 20 painters of inferior rank, nor say that Einstein's worth can be approximated by the combined products of 30 run-of-the-mill physicists. These rare individuals are invaluable in the sense that they produce something that no collection of other persons can produce. The same generalization holds at lower intellectual levels. No collection of persons of below average intellectual abilities can match the best contributions of the physician, the college professor or the executive. Attempts to use to the utmost the intellectual resources of the society can result in incalculable benefits, not only to the individual, but to the society as a whole.

This conference seemed particularly significant because of the current emergence of new research trends and directions. Different research methods, techniques, and theoretical orientations are being brought to bear upon old problems and consequently should produce a more scientifically sophisticated approach to the field of gifted children.

The meeting coincided with the establishment of the Talent Development Project in the U. S. Office of Education, which is to be responsible for disseminating information about studies on gifted children, reporting case studies of existing successful programs for gifted children, holding conferences with leaders of business and industry, and establishing demonstration centers which would illustrate effective educational and research operations with gifted children.

The conference itself appeared to pass through three different phases. First, the conference members expressed their views on current research problems and the difficulties they observed from their individual vantage points. Second, areas of needed research emphasis were considered, together with a variety of methodological questions and third, broad research strategies were discussed to determine a variety of attacks on the problems in this field. Prior to the conference, many research articles and reports were circulated to brief the participants on the research activities of other conferees and to reduce, as much as possible, the amount of time spent at the conference on literature review and associated activities.

This report contains some generalizations that arose from the discussions, and presents a variety of research problems and possible research strategies.

A Few Generalizations

As the discussions progressed it became obvious that, although there were inevitable differences of opinion on many issues, there were large areas of

agreement on basic ideas or concepts. There were three generally accepted assumptions that cast long shadows into the future in terms of the types of research being planned and the kinds of educational programming that will in the future be presented to intellectually superior children, and, indeed, to children of all ability levels. The reader will notice how directly the material in the rest of the report relates to these three generalizations:

1. Intellectual talent should be considered multi-dimensional and needs to be, in some respects, redefined. There was a strong feeling that important aspects of intellectual performance have been overlooked through the acceptance of the IQ score as an operational definition of intelligence. The search for these additional intellectual dimensions and the factors related to them was one major point of emphasis in the group.

2. Intellectual talents are, to an unknown extent, capable of modification. Environment, then, can have either an inhibiting or an encouraging effect upon the development of intellectual talent. Such an assumption places a heavy responsibility on the culture and the educational system, but it is also an exciting one for the educator and the social scientist. The concept of "intelligence" as genetically determined has been replaced by the concept of a pliable and plastic intellect which is responsive to the environment in which it is

placed. The place of genetics in intelligence was not denied; rather the place of environment and its interaction with genetics was reaffirmed.

Other implications of this concept are (1) that prediction of future intellectual ability will need to take into account past environment or future experiences in order to have some semblance of accuracy; (2) any classification of giftedness should be tentative and used rather for present educational planning than for future prediction; (3) the younger the child the more plastic his abilities; (4) prediction of future performance should not be ruled out, rather its complex nature and problems should be more fully realized.

3. <u>There exists a close relationship between motivation and personality variables and the development of intellectual abilities</u>. This idea is, in some respects, an outgrowth of point 2. While prior research has disclosed relationships between personality and intelligence, they have not generally been considered causal in nature. At the present conference, there was a general acceptance of the notion that some motivational and personality variables are, at least partially, causal in nature and inseparable from the total consideration of intellectual functioning. These relationships were held to be particularly striking in the area of set, or attitude

toward learning. Personality also seems to play an important role in the flourishing or withering of creative abilities.

These concepts were not new discoveries of this group. Most, if not all, of the conferees have been operating in their own research on the basis of these ideas for many years. Conference discussions did dwell upon the extensions of these ideas and concepts. It would seem valuable also to present them explicitly, since there is often a considerable cultural lag between the scientist and such an amorphous and busy consumer as American Education.

The following summaries of the topics or problems discussed at the conference are placed in arbitrary groupings in order that the reader may see trends in these areas. In the meetings themselves, discussion ranged over the spectrum of possibilities and was not restricted to any set or given order of consideration. These summaries are representative of the subjects discussed rather than comprehensive.

The Definition of Giftedness

There has been a certain disillusionment over present definitions of high intellectual ability. Conference members felt that a close examination should be made of the validity of some of the earlier measures of intellectual abilities. Special attention needs to be paid to developing instruments for measuring cognitive abilities in areas of intellectual operation previously overlooked.

The use of the IQ test as an operational definition of intelligence seems justified only if what the IQ test measures is itself considered to be important and valuable in this culture. The essence of giftedness is, or seems to be, inseparable from its socio-cultural environment. The concept of a culture-free intelligence test seems to have little meaning.

While IQ tests have contributed much to our knowledge of human intelligence, certain limitations of the validation procedures used on these measures were noted. Two major methods of validating measures of mental ability in children have been (1) the selection of abilities that were developmental in nature (i.e., more children of nine years would pass a test item than would children of eight years) and (2) the prediction of school success.

There is now some reason to believe that certain important intellectual abilities do not follow a smooth ascending developmental curve. This applies particularly to those abilities which are sensitive to cultural discontinuities and which may fluctuate considerably from age level to age level. Intellectual fluency, for instance, seems to follow an uneven developmental curve. Such "unstable" abilities, and items representing them, would be discarded from test instruments which assume a smooth ascending curve for all abilities. In this way, it is surmised that early test constructors may have inadvertently, but systematically, screened out certain intellectual abilities from their tests.

A second limitation of the traditional approach is that the instrument has become tied to a definition of "school success." If school success (teacher grades or achievement test scores) were dependent upon dutiful reciting of predigested material, would we be happy to validate our measure of intellectual ability against such a criterion? There is some indication that, as schools change their definition of academic success in the direction of rewarding more independent thinking, and less rote memory the predictive power of present aptitude tests becomes less marked.

Alternative Approaches

There was general agreement among conference members that it would be fruitful to move away from the "g" factor, or omnibus measure of intellectual

ability, to more precise measurement of a number of different dimensions of intellect. Several alternative approaches were suggested regarding further investigation into the development and measurement of intellectual processes. One of these approaches involves the use of factor analysis to reduce the number of apparent dimensions being measured and to aid in the more precise identification of these dimensions. The crucial role played by the investigator should not be overlooked in this approach. His influence operates in choosing the tests included in the battery to be factor analyzed and also in labelling and identifying the factors which the computer analysis produces. The benefits of the factor analytic approach seems to stem from the gradual weeding out of the non-essential tests and the conceptual sharpening of the various ability dimensions that the research person has had the foresight to include in the test battery.

The specific use of cognitive measures to predict future performance should be accompanied by pertinent measures of noncognitive behavior. Most studies using multiple correlation with a criterion of academic success have found an important component of successful prediction in the attitudinal and personality dimensions.

Another approach is to take a circumscribed area of intellectual development and find its correlates in a wide variety of circumstances and populations. Tests of such specific dimensions as originality or certain conceptual styles (such as leveling vs. sharpening or defense vs. growth) would fit this approach. One such limited area might be the characteristic tendency of some children to delay, or to choose impulsively, in situations requiring decision-making of one sort or another. An attempt to find the correlates of intellectual foresight or rigidity would fit into this category.

Another more extensive subcategory of cognitive processes thought worthy

of more study is that of creativity. A number of different approaches were listed for attacks on this problem area. One could study the creative person, the creative process, the creative product, and the creative situation or environment. The creative product has been an especially neglected area of investigation. What are the qualities which distinguish a creative from a non-creative product? Can one study the product apart from the producer?

What is the relative importance of cognitive and personality variables to creativity? What relationships exist between tests used to discover "creative" abilities in children and the performance of creative persons in adulthood? A bridge needs to be constructed between childhood behavior and later significant performance. The necessity for some external criterion of creativity was pointed out.

The "creative process" has undergone much observation and retrospective analysis by creative individuals. It remains a fascinating area for future research. There seem to be many <u>necessary</u> conditions available before the emergence of the creative act. The presence of any one of these conditions by itself may not be sufficient to insure its emergence. Therefore, it is important that research identify, as completely as possible, these necessary conditions. While a basic minimum of cognitive abilities seems necessary for creative production, current interest seems to center on personality factors as related to creativity.

There may have been an overemphasis on verbal constructs in the development of tests and measures of creative abilities. Many kinds of productive thinking and creative performance may have non-verbal bases and it is important to realize that a study of verbal symbol systems, while important, should not overly dominate research activities in this area. It is important to conceptualize, and to do research on, symbol systems other than the verbal, in

order to understand more clearly the creative production of youngsters in such areas as art and mathematics.

The conference members were concerned with a number of methodological problems connected with new measures of cognitive abilities. One of these concerns is the validity of the measures themselves. Many of the new scales owe their existence to factor-analytic studies, and have not received much external validation. There appears to be, at the present time, some question as to whether high performance on tests such as intellectual fluency or flexibility do, in reality, relate significantly to creative production in adulthood.

Another concern about the new measures of cognitive abilities relates to their stability. If performance on tests of such qualities as flexibility or foresight is influenced significantly by motivation or attitude, then it may be difficult, if not impossible, to reproduce such conditions in a second examination. Hence individual tests of such dimensions are considered relatively unstable. It might be possible to get better results factor analyzing a battery of small tests and by using total factor weightings on a given variable. It has been suggested that this method produces better retest stability than found with individual scales. The responsibility of those investigating these new dimensions should be to consider such problems as, for example, "What is the developmental nature of 'flexibility'?" There is reason to believe, as noted earlier, that some of these dimensions do not follow a smooth developmental curve, and this causes, in turn, serious problems related to prediction.

What is Valued Human Intellectual Performance?

An additional strategy, different from the developmental approach traditionally used in designing IQ tests, was suggested. Can we define

outstanding intellectual performance when it occurs at the adult level? This would first entail the definition and description of outstanding socially valued human achievement, in terms of performances, or products, or both. Such achievement would include the creative or imaginative, but would not be limited to this dimension. Other areas of talent, such as leadership or social facilitation, should be considered as well.

A definition of outstanding socially valued human achievement, formulated by an analysis of such specific description of achievement, may provide many hypotheses regarding the psychological characteristics of persons potentially capable of such achievement. The judgment as to what constitutes an outstanding human achievement may be made by the peers of the individual whose achievement is being judged, these peers being, themselves, experts in the field. This is a type of consensus by qualified judges. Once these valued performances are identified, then those traits which are already manifested in early years, and are shown to be significantly related to these performances, can be used as a means of identifying talent in childhood. When these significant performances are found and related to earlier manifestations of these performances in students, attempts might be made, through proper counseling, to match the needs of the culture with the maximum talent of the individuals of the coming generation.

Some reservations on this approach were noted:

1. What is to be done about the "late bloomer"? Studies of eminent men indicate that many decided on their chosen fields after starting university work. If they had received counseling based on their test performances while they were still in high school where would they be now?

2. Can peers adequately evaluate outstanding talent or genius? Several instances were noted of combinations of professional jealousy and limited foresight which caused peers, even talented peers, to be prejudiced against some outstanding creators, who therefore went unrecognized in their own generation.
3. If we are intent on matching the needs of the culture to the talents of the students, which takes precedence in the case of conflict? Can we reach a consensus on the "true needs of the culture"?
4. What should be done with the multi-talented student who shows outstanding promise in a variety of fields, e.g., mathematics, music, social leadership, etc.? Will counselors be able to surmount their own biases regarding the "needs of the culture" and give wise guidance to these students?

All of these approaches toward different attempts at measurement received support, with the stated reservations. It was anticipated that the development of new measuring devices eventually will modify and broaden the operational definition of giftedness.

Factors Related to Cognitive Development

The relationship of personality, attitude, and motivation to cognitive development received much attention. The methodologies of factor analysis and multiple correlation confirm the close relationship of personality and attitude variables to productive thinking and creativity. Whenever multiple correlations have been used, weighting dimensions of motives and emotions seems

to improve the predictive ability of the total battery. There is real need for continued useful and productive instrumentation in this area.

Cognitive Styles

One approach which bridges the gap between intellect and personality has been the investigations of cognitive style. Research studies suggest that there are consistencies in the styles of perception, conception, and problem-solving adopted by individuals, and that these are related to certain personality variables. Further work in the area of cognitive style to delineate more precisely the relationship between the development of personality structure and cognition seems desirable.

The growing interest in the relationship between personality and intellect sharpens the need for effective measuring instruments and theoretical structure. There was a difference of opinion among conference members on the utility of self-descriptive tests. Those instruments that ask for too direct a statement of attitudes or feelings may well elicit responses based on some perceived role on the part of the subject rather than his true feelings or personality characteristics. However, self-descriptive scales that are more subtle in nature, where the direct purpose of the investigator is not manifest, were endorsed by some conferees.

While the instruments attempting to measure self-concept are often disappointing, there is evidence to support the notion that the self-image of the individual is an important determining factor in his behavior and attitudes. These self-attitudes constitute one factor influencing the direction of the talent expression. Therefore, efforts should be continued to find dependable ways of measuring this factor.

Underachievement

A number of research designs seem to have outlived their usefulness, or need drastic revision in terms of methodology or theory before they can

contribute further. The area of underachievement was one specific example of an area in need of different approaches.

Some of the conferees voiced dismay over the extent to which questionable measurement assumptions underlie some definitions of underachievement. It was pointed out that the correlation between intelligence and achievement rarely gets above .50 and that the use of intelligence tests as a sole measure of achievement expectation seems unjustified. Yet this assumption of perfect relationship between intelligence and achievement has frequently been the basis for the identification of underachievement.

While a consistent body of knowledge concerning chronic underachievers suggests that there are certain types of syndromes associated with the problem, the implication that these low achievers could be doing better has been questioned. It was pointed out that one acid test of this proposition might be a training program which did help such individuals to develop more effectively. The evidence on the effectiveness of such special training programs has not been impressive. There is little evidence to suggest that the life patterns of "underachievers" can be modified so as to improve their achievement very greatly. Most of these studies, however, have been made at the secondary school level. It would seem reasonable to try to identify underachievers earlier, and to try to modify their environment so as to encourage them to achieve more. A careful longitudinal follow-up of such groups might increase greatly our knowledge of chronic underachievement.

Sex Differences

One of the problem areas discussed at length was that of the significance of sex differences discovered on measures of cognitive style, divergent thinking, and reasoning abilities. Many investigators seemed to have found boys superior to girls, particularly in the analytical and reasoning processes.

It was recalled that test items showing sex differences were often discarded by IQ test constructors. Such sex differences seem to be real, but the explanation for the differences is not at all apparent. While one can make a case showing that the greater restrictions and controls placed on girls in our culture inhibit productive thinking, there are alternative explanations that would fit the same data. There is a need for a more adequate theory to account for developmental differences between the sexes.

It was pointed out that even similar behavior on the part of boys and girls may require markedly different psychological interpretation for the different sexes. Although there are many possible cultural factors that could account for these sex differences that have been obtained in cognitive performance, genetic factors cannot be ruled out as possible causes of the variation. Research evidence reported by conference members seems to show that both cultural and genetic factors are involved in some unknown proportions.

Both the origins and the development of perceived sex-roles need further scrutiny. Apparently these roles are established at an early age and influence the individual in various departments of life, such as occupational choice, interests, and hobbies. The phenomenon of creative women appearing to be more masculine and creative men appearing to be more feminine on certain test measures, needs to be looked at more thoroughly. The suggestion is that the creative person is able to accept those elements in his personality that are conventionally associated with the opposite sex, and that this acceptance frees him to become not only a more creative person, but also a person who retains his essential sexual identification. The creative person seems to be relatively independent of culture-imposed roles. The investigators of perceived sex-role should take cognizance of the rapidly changing mores of our culture.

Ego Development

The ego development of the creative or productive person has not been studied effectively. Early autonomy and relative independence from parents seem to yield both flexible behavior and inner controls over the emotions and thinking. This autonomy seems to be reflected in personal satisfaction obtained through intellectual activity, even in the apparent absence of social reinforcements for such activity.

What is the relationship of achievement via conformity and achievement via independence in different settings? How are they related to the environmental structure at each successive level of schooling? Is it possible that even creative adults could go through periods of early conformity before their later independence?

What are the effects of aloneness and of group interaction under various conditions? Does the peer group sometimes operate to inhibit intellectual activity in the individual? Is a combination of group interaction and periods of solitary work desirable for maximum productive thinking? Is it possible to develop a training program to allow a child, at an early age, to play with such verbal tools as analogies, similes, etc., in order to interpret better his life experiences?

Can the concept of deprivation be extended to include isolation from the self? Is it not possible for individuals to be so overwhelmed with external stimulation and group interactions that they have no chance to be alone, to get acquainted with themselves, to engage in self-communion?

The area of self and social-self concepts seems to provide a rich area of investigation for both theoretical and applied research.

Social Environment

The need for a better sociological approach to many issues was affirmed. Constructs, such as "role behavior," and methodology related to the study of group interaction, seem to be necessary additions to future research on gifted children and their education. The important shaping role of social interaction was stressed. Much has been written about the influence of the parent on the child. Little attention has been paid to the possibility that the child influences the response probabilities from his environment by his own behavior. Thus, a hyperactive child forces a controlling environment upon himself, while a happy, placid child encourages the parent and teacher to grant him more freedom.

The gifted child may well create in the educational setting a specific response environment which calls for less discipline but more intellectual challenge. In terms of style, the teacher of gifted children may be freed from mere lecturing in the classroom, and enabled to be rather a guide and consultant.

Research into the methods of facilitating educational change should depend upon sociological constructs regarding the nature of social institutions and the methods of modifying them. For example, provisions for special programming for gifted children will be accepted by educators and the general public only to the extent that they do not conflict with important social values in the dominant culture. Too often those sociological variables have been ignored in educational planning. If there are social discontinuities in our culture, (e.g., encouraging freedom in preschool groups and control in elementary-school classes), it is likely that social variables related to these factors are discontinuous also. Such discontinuities may well need study in their own right to see how they influence the productive thinker or the creative process.

The Culturally Disadvantaged

Another subject discussed with considerable interest was the problem of discovering intellectual ability in youngsters from culturally deprived environments. These children present a most difficult methodological problem with respect to identification. If the basic premise is that intellectual potential is modifiable, we must then accept the conclusion that it is modifiable downward as well as upward. In working with the culturally disadvantaged, investigators and educators must therefore remember that in many of these children intellectual potential has been depressed and cannot be identified as easily as in children who have had cultural advantages.

Even more important than the problem of identifying the gifted children among the culturally disadvantaged would be investigations into what kind of educational programming can improve their intellectual development. The construction of such a curriculum, grounded in cognitive theory, could be an important contribution to the education of these disadvantaged gifted students.

The usefulness of multidimensional measurements in testing disadvantaged children seems evident, but many conference members pointed out that the use of nonverbal tests does not solve the problem of cultural disadvantage. If anything, nonverbal tests may be more culturally loaded than verbal tests. It may even be necessary to abandon the forlorn search for some universal tests of intellectual talent, apart from the social background of the individual. If one necessary condition for the flowering of intellectual talent is a reasonably stimulating social environment, then that reasonably stimulating social environment must be provided for the child before any final evaluation can be made of his creative or intellectual potential.

The study of group processes also entails the recognition of the multivariate nature of the conditions being studied. It is important to recognize

not only that there are many different factors in such a complex product as creative thinking, but that these factors may have different weight in different individuals, and that different social situations can alter the effects of different sets of variables. The problem, then, is how to deal with these matters through research design and analysis. The growing tendency for researchers to study the child in his social milieu (the school, peer group, etc.) will likely lead in the future to more extensive consideration of these numerous and complex social factors.

The Educational Environment

The assumption that intelligence is multidimensional and capable of being modified accentuates the importance of education for the optimal development of intellectually superior children. Instead of the educator's being forced to modify his program to fit the presumed genetically predetermined intellectual level of the students, he now faces the opportunity and the challenge of modifying the abilities of gifted students through effective programming. The research person faces the challenge of trying to evaluate the relative effects of a multiplicity of variables upon the child in a complex group situation such as the classroom.

Program Evaluation

Considerable concern was shown about the problem of evaluating new educational programs. This problem is made doubly important by the recognition of the critical role played by various intervention techniques in the eventual development, or lack of development, of productive thinking abilities. The many new curriculum developments, in a variety of content areas, have caused research persons to realize the multitude of difficulties that arise in efforts to evaluate the usefulness of any new program. Since achievement tests are designed to measure how closely a curriculum is approaching its

stated goals, they are not useful when the goals of the programs to be compared differ. Evaluation studies of a number of curriculum projects are suspect because they either used old achievement test measures to judge new curriculum methods or used newly designed tests, which tend to report favorably the results of the new curriculum methods and unfairly penalize the student educated in the traditional curriculum.

The consensus of the conference members was that there are a number of more or less satisfactory ways to solve this problem. In a sequential curriculum, such as mathematics, it is possible to compare two different teaching methods to see which better prepares students to master concepts at a higher, more advanced level. For example, one of two different methods of teaching mathematics in elementary schools could be judged better because students taught by this method learned calculus more readily later on.

A second way of solving such a problem would be to measure expected by-products of the different methods. Claims have been made for some of the new curricula that they improve "productive thinking" or "creativity," etc. The validity of such claims can be tested through the usual pre-post test kind of comparison on tests of the characteristic presumably improved (i.e., problem solving ability) as a result of the new training program.

A third method of evaluation involves establishing a type of task dimensionality. This involves a detailed statement of the specific knowledge, skills, habits, and attitudes which are expected to result from the program. Procedures can be developed to measure the effectiveness of the program in achieving these objectives and to compare the results achieved by the program with those obtained by using other programs.

A fourth method is an attempt at process analysis. The program is evaluated through systematic analysis of the progressive teacher-student or

student-student interactions and a comparison can be made between methods based on some predetermined theoretical structure or goal. Thus, one could study the number of conclusions or generalizations produced by the students as opposed to the generalizations by the teacher in class sessions under different programs of instruction.

Some doubt was expressed about the possibility of improving curriculum or pedagogy through the use of a pretest-posttest type of design in evaluating educational programs. This approach allows only for the discovery of gross differences between treatment and non-treatment groups without permitting further specification of the relevant factors in the teaching situation which caused the observed differences. An outstanding example of failure in this regard is seen in the limited and confusing effect that the multitude of studies on grouping have had on program development.

Considerable interest was shown in attempts to measure the sequential interaction of teacher-student and student-student activity in the regular classroom and also in more structured experimental situations. These approaches measuring the progressive development of ideas and concepts in the educational environment may, if adequately grounded in psychological and sociological theory, be useful in suggesting the types of teacher behavior, or environmental modification, or group membership, etc., most conducive to productive work or whatever the classroom goal is for gifted children.

One limitation to the above approach was pointed out. The classroom is a poor place to study individual creative abilities or intellectual development per se, because of the many different social variables operating there. Creative abilities need to be studied in more experimental situations where the environment can be better controlled. Nevertheless, the interaction between social factors in the classroom and productive performance remain a legitimate target for investigation.

The Teacher

Another and more informal method of obtaining data on classroom performance and the sequential development of ideas is to use the teacher as a skilled observer. The elementary school teacher in particular, being in contact with gifted children as much as five hours a day, has an unparalleled opportunity for close analysis of behavior. It was pointed out, however, that careful planning is necessary if maximum use is to be made of the teacher as an observer. The teacher must be trained specifically in observing the dimensions of interest to the research person. In the press of other problems and responsibilities, it often does not occur to the teacher to look specifically for qualities such as dependency, ego defensiveness or achievement orientation, unless he is carefully instructed to do so.

Since the teacher is considered the key factor in any modification of school environment, he becomes an important subject for investigation by the research person. Are teachers of gifted children under special pressure? Do they need special types of personality or special kinds of training? It has been previously noted that the children often create their own response environment. They can determine the amount of teacher participation, the degree to which cooperative intellectual activities can be supported and encouraged, and the degree to which certain types of classroom planning can be delegated by the teacher. To what extent, then, does the teacher of gifted children control the educational environment and to what extent is he controlled by the characteristics of the learners before him?

What are the effects of a variety of teacher-student interaction techniques? Does praise bring forth better production under all circumstances, with all kinds of children, from all sorts of teachers? Many prescriptions for teacher behavior are clearly too general, as well as too primitive and

simple, for the complex interaction situation of a particular classroom. A complex multivariate approach would seem to be most appropriate to weight properly the important factors at work in a given situation. Another reason for discouraging simple correlational studies is the necessity of studying the many possible by-products of experimental intervention. In addition to considering the effects of the main attack, such as changes in cognitive style or improvement in mathematical skills, it is necessary to look also at possibly unanticipated by-products. Some such by-products might be modification of self-concepts, changes in attitudes of peer groups, the creation of new social alignments, identification with new heroes, the development of new loyalties, etc.

Finally, there is need for expanded work in the area of curriculum development, which would include such approaches as programmed learning and instruction. Programmed learning might be used to help develop a systematic organization of techniques and approaches for the optimal stimulation of intellectual processes. While the research person has not often seen himself in this role, one could argue, for example, that he should be the person best able to organize on a firm theoretical base a series of exercises to stimulate divergent thinking. Ideally, a team of the curriculum specialist and the specialist in cognitive processes could produce programmed learning that would combine the best contributions from both specialties in building more challenging educational programming for gifted children.

Some Research Strategies

In its final phase, the conference considered a variety of research strategies that would seem useful in attacking the problems discussed in the previous section. Two major concepts received general endorsement:

1. Research should be conducted and supported on a more long-range and programmatic basis.
2. Various research efforts should be better coordinated than they have been in the past.

A number of the conferees pointed out the essential wastefulness of fragmentary bits of research in which a small study on one part of a problem is done with a special group of subjects, while another study on the same problem is done in another place with different measuring instruments and subjects. The difficulty in coordinating or integrating the results from such research has been manifest in the reviews of the literature.

A coordinated research program would open up many possibilities not available to the individual researcher. This type of organized research would be useful in attacking an important problem that had many facets. A number of investigators could coordinate their efforts by prior selection of subjects, measuring instruments and analysis methods. Such an all-out attack could produce necessary information on a problem of agreed importance in a much shorter period of time than the catch-as-catch-can approach. Continued interaction among investigators employing different approaches to a given problem (experimental, descriptive, longitudinal, etc.) could lead to new insights and a more balanced view.

The stress placed upon the study of developmental processes suggests, of necessity, longitudinal research. There were numerous doubts voiced that some relationships between early and later cognitive development presupposed on the basis of cross-sectional studies, may not exist in that hypothesized form at all. Some suggestions were made regarding the possible use of a modified longitudinal research involving the use of overlapping age groups, a method which would, to some extent, be a compromise between the long-term program research and shorter-range studies.

The acceptance of the view that it is important to undertake long-range and cooperative research programs has a number of implications for institutions of higher education, where the larger part of such research would probably be carried out. One necessary consideration in planning for such research is staff continuity. Universities or colleges will have to make some staff commitments over an extended period of time to persons whose major interests are in programmed or longitudinal research. These commitments should be such as to enable the person to stay for the tenure of the project, instead of being lured away by other more attractive offers with more security, thus breaking the continuity of the project itself.

Not all universities, colleges, and funding agencies look favorably on research planning of this nature; many deplore the long-term commitment of university funds and the consequent freezing of university facilities. Administrators are notoriously reluctant to make such commitments. Despite this difficulty, however, the consensus in this conference appeared to be that carefully planned projects of this sort are necessary and important.

Long-term support was felt to be especially important in the investigation of such subjects as the developmental processes of cognitive abilities. There was, however, general recognition that a number of problems are connected with long-term research programs, problems which must be solved in order to insure maximum effectiveness for such research. One suggestion stressed the necessity of inserting short-term research goals which supplement the longer range goals of the project to provide stimulation and reinforcement for project staff. Another problem is how to transfer responsibilities in the event of the absence or departure of the principal investigator of a long-range project. This problem suggests that long-range projects are best carried on by groups of investigators or institutions centered in a university

or other organization where the loss of a major investigator need not be a crippling one since the responsibilities could be transferred to another staff member already familiar with the project and its goals.

The above discussion of cooperative programs or projects should not be interpreted as denying the importance of the individual research person and his role as an idea-producer. Often a research approach which seems bizarre and unusual to the present generation, becomes a bridge to future development in the field. Ideas and new directions can often be traced to a single individual, while groups seem to consolidate an area of thought more effectively. How can granting boards, manned by research persons accustomed to traditional research designs and problems, be encouraged to try something really different? The conferees recognized the problem, but no clear solution was forthcoming. As long as the membership of review boards is sensitized to the problem, they hopefully can be counted on to consider carefully the unique and the unusual request.

Conferees felt that financial support should not be limited to long-range projects or established investigators. There must be provision for support of pilot research, particularly for those persons who have not yet established themselves in the field and thus have difficulty in obtaining research grants. There was strong support for a program which could award small grants of money to promising young scholars that would allow them to begin pilot work on research problems of their choosing.

The need for further investigation in the area of test instruments was stressed. The past has given eloquent evidence as to the multitude of uses to which effective measuring instruments are immediately put, once developed. The importance of tests in discovering gifted children is another valid reason for supporting the development of tests of the cognitive processes. It goes

without saying that the standard requirements, such as reliability, stability and external validity, should be met by the test constructor. The requirements for the full development of adequate tests are so extensive as almost to demand a cooperative approach.

Another major research strategy which was favored is the use of systematic interventions in the educational environment in order to produce positive gain in cognitive processes or associated variables. Since the whole educational process is one massive effort to modify the learning environment of the individual for the purpose of attaining certain goals, the educational environment will, no doubt, be a major focus for such research. The relative effectiveness of various types of intervention are important concerns for education. It was pointed out that educators probably spend less money on product evaluation than is spent by any large business or political institution. The future probably will see more financial support for the research and development aspects of education.

Another major research strategy suggested is the carrying out of a variety of studies (perhaps with semi-coordinated planning) on the relationship between cognitive styles and associated social and personality variables. Some of these studies could, no doubt, be executed in coordination with longitudinal studies and could represent some of the short-term goals of those projects. A number of such studies could lead to a more adequate theoretical formulation of this important area of cognitive and personality development.

Considerable interest was shown in the use of process analysis as a means of identifying the complex interaction variables present in such situations as small group activities or the classroom. In this regard, some suggestions were made that a data bank might be created whereby investigators would have at their disposal certain raw data that could be analyzed in any

way that the investigator would think valuable. Since the technical problems involved in the collection of tape or video tape recordings of interaction situations, such as occur in the classroom, are formidable, such a data bank could be a valuable source for investigators who have neither the financial nor the technical means to collect such data, but who do have some interesting ideas about analyzing the raw material.

Another suggestion was that data on tests of personality or cognitive abilities, collected on large samples of children, might be placed in such a data bank, to be drawn upon by proper investigators for legitimate research projects. Such a bank could be administered and its existence publicized by the Cooperative Research Program or the Talent Development Project in the U. S. Office of Education.

Miscellaneous Problems

Several other miscellaneous issues of note should be reported. There was discussion regarding the necessity for efficient dissemination of information. The rapid development in these research areas make some cultural lag inevitable, but it should be kept at a minimum. In order for information to be available to other research persons and other interested parties (such as educators) critically involved in similar projects, the final reports on research projects need to be available in sufficient numbers to satisfy the demand of other investigators and consumers soon after the completion of the research. The serious publication lag (sometimes over eighteen months) in traditional journals makes it important that funding agencies provide for publication of the final reports of research and also that they publicize the nature and availability of these reports.

There was a feeling that conferences, such as this one, serve one important purpose in bringing researchers up to date on relevant activities

in their special interest areas. But even more important, such conferences help the members to sharpen their own ideas and concepts on the whetstone of comment by their professional peers. In the modern university setting, where one's colleagues are usually busy in their own research, graduate students often provide the only source of consistent feedback for the research scientist on his ideas. While useful, such feedback is obviously limited in its quality and in the nature of the critical comments. These conferences can fill a genuine need of the research scientist by providing him with a sophisticated cross-fertilization of ideas.

Ethics and Research

It is fitting to end this discussion of research on gifted children with some statements regarding the obligations and responsibilities of the research person in our society. With the steady expansion of our knowledge, and the development of better theoretical constructs and instrumentation, the research person can be expected to move from the descriptive type of study to studies where he actively intervenes in the life of the gifted student. He will be active in attempts to modify and improve certain aspects of the child and his environment. This transformation of the scientist from an observer of life to an active participant may, of course, provoke certain objections to his activities, and also some soul-searching on his own part. How does the social scientist justify his "interference" or attempts to modify the child and his environment? This is a particularly pertinent question in view of the tendency, in some quarters, to talk about gifted children as a natural resource in much the same way that we speak of our iron deposits or corn production.

What are the rights of the child and of his parents? Several points were made in this discussion. First, the social scientist is under an ethical obligation never to introduce conditions that might be expected to be harmful

to the child. This idea is codified in formal statements of ethical standards of various professions. Second, we should remember that the scientist is not the only one who is intervening in the life of the child. In fact, the child's whole environment consists of people trying to modify and change him. His parents, his teachers, his friends, and many social institutions all try, in their own ways, to mold and shape the individual in various ways. These efforts differ from those of the scientist in that the scientist's careful observations and methods should enable him to say with confidence what the result of his intervention was in a given instance. The usual attempts to change or influence the individual are carried out so haphazardly that no clear reading of the results can usually be taken.

Third, no significant amount of intervention should be attempted without a full explanation to parents or schools or other responsible agencies. It is true that any type of intervention runs the hypothetical risk of changing the child in some unforseen and possibly detrimental fashion. The scientist's intervention, however, is no different in this respect from any other life experience that the child might undergo. In fact, the precautions and careful observations of the scientist probably make the risk less in his intervention than in comparable life situations controlled by nonscientists.

What is the alternative risk to intervention? (There always is an alternative risk!) The risk would lie in our failing to use collected research knowledge to improve our efforts to develop intelligence, to stimulate creativity, to produce responsible citizens. In many ways, this would seem to be a graver risk. It would involve us in a commitment to the status quo, and to the presumed adequacy of present practices. This is a commitment that most, if not all, of us would be unwilling to make.

If a conference similar to this one were held again in 1970, what

developments would the participants look back upon and what gains would be charted? It is difficult at this short range to predict specific gains. However, given the present level of development, a favorable climate for future research, and anticipated growing financial support for research, we can look forward to important advances which will soon leave the present report sadly outdated.